

Claims

1. A method for allocating channels in a cell of a cellular communication system having a plurality of cells comprising:
 - a. dividing the cell into a plurality of sectors;
 - b. subdividing channels allocated to the cell into frequency subgroups;
 - c. assigning the frequency subgroups to respective sectors in the cell;
 - d. allocating channels within each sector to users in the corresponding sector;
 - e. when the number of channels allocated in a first sector of the cell reaches a predetermined threshold, reassigning an unused channel from a second sector in the cell to the first sector.
2. The method of claim 1 further including the step of further reassigning the reassigned channel back to its original sector when the reassigned channel is demanded in the original sector.
3. The method according to claim 1 further including the step of determining whether the unused channel in the second cell is in use in another co-channel cell in the network before the unused channel is reassigned to the first sector.
4. The method of claim 3 further including the step of placing the reassigned channel on a hold back list in the co-channel cell designating channels that should be among the last to be allocated.
5. The method of claim 4 further including the step of reassigning the reassigned channel back to its original sector when the channel is demanded in the co-channel cell.

6. A method for allocating channels in a cell of a cellular communication system having a plurality of cells comprising:

- a. dividing the cell into a plurality of sectors;
- b. subdividing channels allocated to the cell into frequency subgroups;
- c. assigning the frequency subgroups to respective sectors in the cell;
- d. allocating channels within each sector to users in the corresponding sector;
- e. when the number of channels allocated in a first sector of the cell reaches a predetermined threshold, determining whether unused channels are available in a second sector of the cell;
- f. if an unused channel is found in the second sector, determining whether the unused channel is currently in use in another co-channel cell in the network;
- g. reassigning the unused channel from the second sector in the cell to the first sector in the cell if the unused channel is not currently in use in the co-channel cell.

7. The method of claim 6 further including the step of further reassigning the reassigned channel back to its original sector when the channel is demanded in the original sector.

8. The method of claim 6 further including the step of placing the reassigned channel on a hold back list in the co-channel cell designating channels that should be among the last to be allocated.

9. The method of claim 8 further including the step of reassigning the reassigned channel back to its original sector when the channel is demanded in the co-channel cell.

10. A method for allocating channels in a sectored cell of a cellular communication system having a plurality of cells comprising:

- a. dividing the cell into a plurality of sectors;
- b. subdividing channels allocated to the cell into frequency subgroups;
- c. providing a transceiver array for each sector, wherein each said

transceiver array includes a plurality of primary transceivers for channels allocated to the corresponding sector and one or more redundant transceivers for channels allocated to other sectors of the cell;

d. placing the primary transceivers in each sector in active mode while said redundant transceivers are placed in a standby mode;

e. allocating channels in each sector to users in that sector;

f. determining the loading of each sector of the cell;

g. when the loading in a first sector reaches a predetermined threshold, reassigning an unused channel from a second sector to the first sector;

h. placing the primary transceiver in the second cell corresponding to the reassigned channel in a standby mode; and

i. placing the redundant transceiver in the first sector corresponding to the reassigned channel in a an active mode.

11. The method of claim 10 further including the step of further reassigning the reassigned channel back to its original sector when the channel is demanded in the original sector.

12. The method according to claim 10 further including the step of determining whether the unused channel in the second cell is in use in another co-channel cell in the network before the unused channel is reassigned to the first sector.

13. The method of claim 12 further including the step of placing the reassigned channel on a hold back list in the co-channel cell designating channels that should be among the last to be allocated.

14. The method of claim 13 further including the step of reassigning the reassigned channel back to its original sector when the channel is demanded in the co-channel cell.

15. The method according to claim 10 wherein said redundant transceiver is a frequency agile transceiver and further including the step of programming the redundant transceiver to operate on the reassigned channel.

16. A base station for a sectored cell in a cellular communication system comprising:

- a. a plurality of antennas for broadcasting and receiving signals in respective sectors of the cell;
- b. a transceiver array for each sector operatively connected to the antenna for that sector, each transceiver array including a plurality of primary transceivers for broadcasting and receiving signals on the channels that are allocated to the corresponding sector, and at least one redundant transceiver for transmitting and receiving signals on communication channels allocated to another sector in the cell;
- c. a base station controller operatively connected to each transceiver array for monitoring channel utilization in each cell and for reassigning a channel from a first sector in a cell to a second sector in the same cell when the loading in the first sector reaches a predetermined threshold.

17. The base station of claim 16 further wherein the base station controller reassigns the channel by placing the primary transceiver in the first sector corresponding to the reassigned

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channel in a standby mode and placing a redundant transceiver in the second sector in an active mode.

18. The base station of claim 16 further including determining means for determining whether the unused channel in the first sector is in use in another co-channel cell in the network before the unused channel is reassigned to the second sector.

19. The base station of claim 18 further including means for placing the reassigned channel on a hold back list in the co-channel cell designating channels that should be among the last to be allocated in the co-channel cell.

20. The base station of claim 16 further including means reassigning the reassigned channel back to its original sector when the channel is demanded in the co-channel cell.

21. A method for allocating channels in a sectored cell of a cellular communication system having a plurality of cells comprising:

- a. subdividing the channels allocated to the cell into frequency subgroups;
- b. assigning the frequency subgroups to respective sectors in the cell;
- c. providing a single transceiver array having a plurality of transceivers corresponding to the channels allocated to the cell;
- d. connecting the transceivers corresponding to each frequency subgroup to an antenna in the sector of the cell to which the subgroup has been assigned;
- e. allocating channels in each sector to users in that sector;
- f. determining the loading of each sector of the cell;
- g. when the loading in a first sector reaches a predetermined threshold, reassigning an unused channel from a second sector to the first sector;

h. disconnecting the transceiver corresponding to the reassigned channel from the second sector and connecting it to said first sector.

22. The method according to claim 21 wherein the step of connecting and disconnecting the transceiver is accomplished by means of a switch.

23. The method of claim 21 further including the step of further reassigning the reassigned channel back to its original sector when the channel is demanded in the original sector.

24. The method according to claim 21 further including the step of determining whether the unused channel in the second sector is in use in another co-channel cell in the network before the unused channel is reassigned to the first sector.

25. The method of claim 24 further including the step of placing the reassigned channel on a hold back list in the co-channel cell designating channels that should be among the last to be allocated.

26. The method of claim 25 further including the step of reassigning the reassigned channel back to its original sector when the channel is demanded in the co-channel cell.

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27. A base station for a sectored cell in a cellular communication system comprising:

- a. a plurality of antennas for broadcasting and receiving signals in respective sectors of the cell;
- b. a transceiver array including a plurality of transceivers for broadcasting and receiving signals on the channels allocated to the cell;

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c. a switching circuit connecting the transceiver array to the antenna in each sector of the cell for switching the transceiver inputs and outputs to respective antennas;

d. a base station controller operatively connected to the transceiver array and switching circuit for:

- i) monitoring channel utilization in each cell;
- ii) switching a channel from a first sector in a cell to a second sector in the same cell when the loading in the first sector reaches a predetermined threshold.

28. The base station of claim 27 further including determining means for determining whether the unused channel in the first sector is in use in another co-channel cell in the network before the unused channel is reassigned to the second sector.

29. The base station of claim 28 further including means for placing the reassigned channel on a hold back list in the co-channel cell designating channels that should be among the last to be allocated in the co-channel cell.

30. The base station of claim 27 further including means reassigning the reassigned channel back to its original sector when the channel is demanded in the co-channel cell.